

African Institute for Mathematical Sciences

ANNUAL REPORT

2009/2010





Foreword by the Director

The African Institute for Mathematical Sciences was created with an ambitious and innovative plan, which is now bearing fruit. The 2009/10 year was marked by rapid expansion for AIMS, with a number of significant milestones being achieved.

More than 300 students, including over 100 women, from across the African continent, have now graduated with the AIMS Postgraduate Diploma in the Mathematical Sciences, with over 95% continuing to Master's and doctorates at African and international universities. AIMS alumni have achieved remarkable successes in a variety of scientific disciplines: 120 have been awarded Master's degrees and 15, doctorates, while 110 Master's and 114 doctorates are currently underway. A number of graduates have returned to their home countries where they are contributing to development in various sectors.

In South Africa there is a scarcity of well trained mathematics and science teachers, and corresponding shortages in the number of mathematics and science graduates. South African institutions of higher education have the responsibility of graduating more South Africans with postgraduate degrees in the sciences, particularly Master's and doctoral degrees. AIMS is working hard to encourage South African students in particular, to pursue scientific careers. One of the initiatives introduced to address this is a joint biomathematics programme offered in collaboration with Stellenbosch University with half of the course taught at AIMS. At the end of 2009 the first group of five South African honours students with biomathematics focus graduated at Stellenbosch University, with seven more registering for this programme at the beginning of 2010.

These are fine achievements by the AIMS staff, its supporters and donors which include the South African Departments of Higher Education and Training, and Science and Technology. Their ongoing support is gratefully acknowledged. Most especially this is a tribute to Professor Fritz Hahne, the first Director of AIMS, who retired at the end of March this year. Under his leadership, AIMS took shape, overcoming many obstacles and challenges, as it earned its place as a respected Pan-African institution for higher education and research.

The AIMS Next Einstein Initiative (AIMS-NEI) – the vision of Professor Neil Turok - is an exciting new development which will see the AIMS model being replicated in other African countries, harnessing both local and international commitment, and contributing significantly to scientific and educational growth in the mathematical sciences in Africa. AIMS-NEI recently received a substantial grant from the Canadian Government, which will enable the concrete expansion of AIMS to centres in Senegal, Ghana and Ethiopia. The first of these, to be opened in Senegal in 2011/2012, has secured support from the Senegalese President, with endorsement by the New Partnership for Africa's Development (NEPAD) and local Senegalese academics. Professor Vincent Rivasseau of the Université de Paris-Sud has contributed significantly to this development. Over the past year a special association and commitment by the Perimeter Institute for Theoretical Physics in Canada has developed, and they have included AIMS-NEI in their global outreach programme.

The AIMS graduation ceremony this year was a very special event, brought forward by two weeks due to South Africa's hosting of the 2010 FIFA World Cup. We were delighted to have the Minister of Higher Education and Training - the honourable Dr Blade Nzimande - as our guest of honour and main speaker. His message to our students, which affirmed the success of the AIMS educational model and alluded to its potential application in other disciplines, was uplifting and encouraging.

Another special event this year was the launch of the AIMS Library Series edited by Professor Alan Beardon of the University of Cambridge. The launch was officiated by Mr Stephen Bourne, CEO of Cambridge University Press.

The AIMS Research Centre has grown significantly over the past year and is now a vibrant young centre. Notable published work and supervision was completed in the areas of mathematical modelling, biomathematics and mathematics of finance. In addition, a number of conferences and special workshops were presented or hosted. In a shared appointment with the University of Cape Town and the South African Astronomical Observatory, Professor Bruce Basset joined the Centre, bringing a large group of postdoctoral fellows and students with him.

The AIMS Schools Enrichment Centre, AIMSSEC, led by Dr Barrie Barnard and its founder Ms Toni Beardon, also had notable success this year. It recently broadened its association by signing a memorandum of understanding with the University of Fort Hare for the joint delivery of professional development training for mathematics teachers. It is planned that AIMS will be more involved in teacher-training by expanding our educational model appropriately.

During the year a number of new appointments were made: Fazley Jattiem took up the position of Assistant in our Facilities and Logistics Division and Thabo Ntitsane joined as Support Technician in our Information Technology Division. To support the expansion and work of AIMSSEC, Najwa Chellan was appointed as Administrative Officer in July this year.

In conclusion, we are proud of the achievements of our students, and thankful to all who support the work of AIMS. It is with particular pleasure that we acknowledge the grants from Google and the Canadian government, which provide tangible recognition of AIMS' success in providing excellent higher education opportunities in the mathematical sciences.







Introduction

This report covers the activities of the African Institute for Mathematical Sciences (AIMS) for the academic year 2009 to 2010. AIMS was established in 2003 in Muizenberg, Cape Town, South Africa. It was the brainchild of Professor Neil Turok who initiated a partnership agreement between the following local and foreign universities:

University of Cambridge University of Cape Town University of Oxford Université de Paris-Sud XI Stellenbosch University University of the Western Cape

The goals of AIMS are:

- To promote mathematics and science in Africa,
- To recruit and train talented students and teachers,
- To build capacity for African initiatives in education, research and technology.



Cambridge
Cape Town
Oxford
Paris-Sud XI
Stellenbosch
Western Cape

Academic programmes

Postgraduate Diploma in the Mathematical Sciences

This highly successful diploma programme was delivered for the 7th time during the period under review. 54 students from 17 African countries were registered in the programme in August 2009. The diploma is accredited by the three local participating universities which each enrolled a third of the students. The costs of delivering the academic programme are covered by the South African Department of Education.

The Diploma consists of three phases:

- The skills courses introduce and refine the problemsolving and computational skills acquired during undergraduate studies, and provide the students with introductory courses in computer programming and scientific writing in English.
- 2. The review courses introduce the students to cutting edge topics in the mathematical sciences.
- 3. In the essay phase, each student writes an essay on a topic selected from a list proposed by local academics.





Skills courses

Period	Contact Hrs	Lecturer	Course Title
24 Aug – 28 Aug	15	Jan Groenewald, AIMS	Introduction to AIMS computing facilities
24 Aug – 4 Sep	20	Frances Aron, AIMS	English Essentials
31 Aug – 18 Sep	30	Dirk Laurie, Stellenbosch	Experimental Mathematics
7 Sep - 24 Sep	30	Alan Beardon, Cambridge	Mathematical Problem Solving
21 Sep – 10 Oct	30	Carl Scheffler, Cambridge	SciPy: Scientific Programming in Python
28 Sep -16 Oct	30	Gordon Johnson, Houston	Integrals and Integration
12 Oct – 30 Oct	30	Barry Green, Stellenbosch	Introduction to Basic and Computational Algebr
12 Oct - 30 Oct	30	David Aschman, Cape Town	Physical Problems Solving
9 Nov – 27 Nov	30	Robert de Mello Koch, Witwatersrand	Electromagnetism
9 Nov - 27 Nov	30	Bernd Schroers, Heriot-Watt	Ordinary Differential Equations

Review courses

Period	Contact Hrs	Lecturers	Course Title
30 Nov - 18 Dec	30	Paul Hewson, Plymouth and Ben Whalley, Bristol	Bayesian Statistics
30 Nov - 18 Dec	30	Seid Mohammed, Addis Ababa	Real Analysis
30 Nov - 18 Dec	30	Rafael Nepomechie, University of Miami	Quantum Mechanics and Quantum Spin Chains
4 Jan - 22 Jan	30	Patrick Dorey, Durham	Solitons
4 Jan - 22 Jan	30	Stéphane Ouvry, Université Paris-Sud	Statistical Mechanics
4 Jan - 22 Jan	30	Tomasz Zastawniak, York	Introduction to Mathematical Finance
25 Jan - 12 Feb	30	Jan Govaerts, Louvain	An Introduction to Quantum Physics and Relativistic Quantum Field Theor
25 Jan - 12 Feb	30	Ryszard Rudnicki, Śląski	Structured population models and their applications in genetics
25 Jan - 12 Feb	30	Prasenjit Saha, Zurich	Astrophysics
22 Feb - 12 Mar	30	Wolfram Decker, Saarbruecken, and Gerhard Pfister, Kaiserslautern	Computer algebra and applications
22 Feb - 12 Mar	30	Ludger Evers, Glasgow and Ioana Cosma, Oxford	Monte Carlo Statistical Methods
22 Feb - 12 Mar	30	Manu Paranjape, Montreal	Quantum Tunneling and Instantons
15 Mar - 2 Apr	30	Peter Clarkson, Kent and Kesh Govinder, KwaZulu-Natal	Nonlinear waves
15 Mar - 2 Apr	30	Jane Hutton, Warwick	Analysis of lifetime data
15 Mar - 2 Apr	30	Jeff Sanders, United Nations, Macao	Functional programming

Essay Phase

During the third semester, students write an essay on a topic which they select from a list proposed by local academics. This essay phase provides an introduction to the research skills necessary for specialisation, and to topics which could become the focus of further studies. This year a number of students chose to write essays in the field of biomathematics. Eight students were supervised by researchers and postdoctoral fellows based in the AIMS Research Centre. A full list of the essay topics is included below.

Name	Country	Topic	Supervisor	Uni/Insti
Agnes Ivy Bimpeh Harrison	*	Square root methods for the discrete logarithm problem	Christine Swart	Cape Town
Ahmed Mohamed Hassan, Husien Hassan	-	Scattering a wave packet off a soliton in one space dimension	Herbert Weigel	Stellenboso
Alex Samuel Bamunoba	•	Cyclotomic Polynomials	Florian Breuer	Stellenboso
Bruce Olivier Kindundu Dienda	*/	On Some Exactness Properties Studied in Modern Categorical Algebra	Zurab Janelidze	Stellenboso
			Cedrick Aurelien Kitio Kwuimy	AIMS
Bryan Garth Davis		Modelling and Dynamics of an Electrostatic Transducer The Microphone	·	
Chika Ogochukwu Yinka Banjo		Collision Avoidance in Unstructured Environments for Autonomous Robots	A Bagula/Isaac Osunmakinde	Cape Town
David Kwamena Mensah		Bayesian Methods for Measuring Acute Malnourishments	Paul Hewson	Plymouth
Elinambinina Rajaonarifara		Dynamic Closure of an Integrated Mycobacterium Tuberculosis Functional Network for Protein Function Prediction	Nicola Mulder	Cape Town
Emma Owusu Kwaakwah	<u> </u>	Ducci Sequences	Florian Breuer	Stellenboso
Enwere Pakith Aria Panzou Pepe		Measurement and Analysis of Femtosecond Optical Pulses	Heinrich Schwoerer	Stellenboso
Eyaya Birara Eneyew		Computation of the Matrix Exponential with Application to Linear Parabolic PDEs	J.A.C. Weideman	Stellenboso
Fadoua El Moustaid	*	Mathematical Modeling of Quorum Sensing in Bacteria	Aziz Ouhinou/Lafras Uys	AIMS
Faikah Bruce	>=	STIs to cure STIs HIV and Drug Resistance	Rachid Ouifki	Stellenboso
Faris Sied Ahmed Mohammed Osman		Parton Statistical Model	A. Peshier/Spencer Wheaton	Cape Town
Franklin Djeumou Fomeni		Metaheuristics for Space Allocation Problems: A comprehensive Survey and Review		KwaZulu-N
· · · · · · · · · · · · · · · · · · ·			Aderemi Adewumi/Montaz Ali	
Gaelle Carine Mbanda Nsoungui		Short Pulse Amplification	Eric G Rohwer	Stellenbos
Gezahegn Zewdie Abebe		Operators and Their Applications to Nonlinear Boundary Value Problems	Francois Ebobisse	Cape Town
Gizat Derebe Amare		On the Impact of Exogenous Reinfection on the Dynamics of Tuberculosis	Rachid Ouifki	Stellenboso
Guy Olivier Ngongang Ndjawa		Black hole in Silhouette	Prasenjit Saha/Petja Salmi	Zurich
Hatson John Boscoh Njagarah	•	On the Dynamics of Substance Abuse: Modelling Drug Epidemics	Farai Nyabadza	Stellenboso
Hilaire Mambo Mobele	*//	Using GO-Universal Similarity Metric for Knowledge Discovery	Nicola Mulder	Cape Town
Holifidy Arisoa Rapanoel		Dynamic Closure of an Integrated Mycobacterium Tuberculosis Functional Network for Drug Target Discovery	Nicola Mulder	Cape Town
Jean Frederic Isingizwe Nturambirwe		Superconducting Quantum Interference Device SQUID Magnetometers Principles, Fabrication and Applications	WJ Perold	Stellenboso
Jeanne Marie Onana Eloundou	•	Avascular Growth, Angiogenesis and Vascular Growth in Solid Tumours: Mathematical Modelling of the Stages of Tumour Development	Hermane Mamboundou Mambili/ Cedrick Aurelien Kitio Kwuimi	AIMS
Jissy Nsonde-Nsayi		Banach Stone Type Theorems	Partha Pratim Ghosh	KwaZulu-N
Juliet Nakakawa	3	On the Impact of Age in the Risks of Disease in Tuberculosis	Rachid Ouifki	Stellenbos
	*		Peter Ouwehand	Stellenbos
Laila El Ghandour		Modelling Dependence of Multivariate Asset Dynamics with Levy Copulas		
Lois Ama Adjei		Fuel Efficient Fastest Path Computation for a Mine Road Network	Kevin Duffy	KwaZulu-l
Ludovic Tangpi Ndounkeu		Stochastic Control: With Applications to Financial Mathematics	Raouf Ghomrasni	AIMS
Maurine Atieno Songa	-);-	HIV-1 latent reservoir persistence under HAART: Antigen-driven T-cell turnover	Aziz Ouhinou	AIMS
Michael Evrard Makouangou Ngouma		Critical Domain Size for a Biological Invasion	Jacek Banasiak	KwaZulu-N
Michael Oluwafemi Ajani	<u>.</u>	Fermionic integration and the Mathai-Quillen form	Bruce Bartlett	Stellenbos
Mile Seitlheko		The Birthday Paradox in Cryptology	Christine Swart	Cape Town
Mohamed Omari	*	Oscillations in a Model for HIV Infection with Three Intracellular Delays and RTI: Delays can induce Viral Blips	Rachid Ouifki	Stellenbos
Mohammed Alhassan Babker Amany Kamblawe	. ⊏	A Phenomenological Study of Nuclear Clustering	Shaun M Wyngaardt	Stellenbos
Mubarak Yagoub Adam Yagoub Yagoub	<u> </u>	Observations in Homogeneous and Inhomogeneous Universe	Carles Hellaby	Cape Town
			Eric G Rohwer	Stellenbos
Nagla Numan Ali Numan		Optical fibres	Aziz Ouhinou/Lafras Uys	
Nomenjanahary Alexia Raharinirina		Mathematical Modelling of Bacterial Run and tumble Chemotaxis	Heinrich Schwoerer	AIMS
Olufemi Opeyemi Olaoye		Evolution of Wavepackets in an Harmonic Potential		Stellenbos
Omowunmi Elizabeth Falola		Minimisation of Sparse Pixels in Colour Feature Extraction: An Assistive Pre-processing Strategy of Road Detection for Robotic Vehicles	A Bagula/Isaac Osunmakinde	Cape Towr
Oyakhilome Wallace Ibhagui		Application of the Kalman Filter to Interest Rate Modelling	Ronnie Becker	AIMS
Paul Kibet Korir		Epitope Discovery with Phylogenetic Hidden Markov Models	Konrad Scheffler/Miguel Lacerda	Stellenbos
Prince Peprah Osei	-	Statistical Methods for Disease Mapping	Paul Hewson	Plymouth
Prosper Ngabonziza	•	Vibration of a Gravity-Loaded Cantilevered Beam with a Tip-Mass	Cedrick A.K. Kwuimy/Gerhard Venter	AIMS
Rose Marie Liliane Amoa		The Fundamental Theorem of Asset Pricing	Peter Ouwehand	Stellenbos
Siaka Lougue	*	HIV Testing and Partner Compliance	Robert Shell/Danielle Kotze	Western C
=		Maxwell's Equations in Terms of Differential Forms	Bruce Bartlett	Stellenbos
Solomon Akaraka Owerre		·		
Suliman Mohamed Abdalla Jamiel		Epidemiology Models with Age Structure	Jacek Banasiak	KwaZulu-l
Tahirivonizaka F.Z. Rahantamialisoa		Ho Lee Model of the Term Structure of Interest Rates	Raouf Ghomrasni	AIMS
Tolulope Rhoda Fadina		Monte Carlo Estimation of the Greeks	Peter Ouwehand	Stellenbos
Tovondrainy Christalin Razafindramahatsioro		Elliptic Curves and Congruent Numbers	Barry Green	Stellenbos
Viateur Tuyisenge	•	Analyzing Non-blocking Concurrent Data Structures	Willem Visser	Stellenbos
· -			Paul Papka	Stellenbos
Wafa Altuieb Mohammed Mustafa	>	Analysis of X-Ray Fluorescence Spectrum	i ddi i dpkd	Stellenbos.







































































54 Students

17 African Countries



Examinations

After submitting their essays, students were required to present their research to a panel which included the following external examiners:

Professor Gerhard Geldenhuys, Stellenbosch University Professor Christopher Gilmour, University of Cape Town Professor Mamadou Sango, University of Pretoria Dr Izak Snyman, Stellenbosch University



Graduation

AIMS was privileged to have the South African Minister of Higher Education and Training, Dr Blade Nzimande, as guest of honour at the AIMS graduation ceremony this year. Dr Nzimande congratulated all the students on their tremendous achievement and acknowledged the high level of collaboration between the three local universities - an important factor in AIMS' success. The festivities took place at the Muizenberg Pavilion where friends, family and colleagues celebrated with the graduates.

Presentations of the AIMS endowed scholarship awards were made at the occasion. The recipients for the 2009-10 academic year were as follows:

Stephen Hawking Scholarship - Mr Guy Olivier Ngongang Ndjawa Martin Rees Scholarship - Mr Prosper Ngabonziza Paul G. Allen Family Scholarship - Ms Omowunmi Elizabeth Falola AIMS Victor Rothschild Scholarship - Mr Ludovic Tangpi Ndounkeu, Ms Holifidy Arisoa Rapanoel

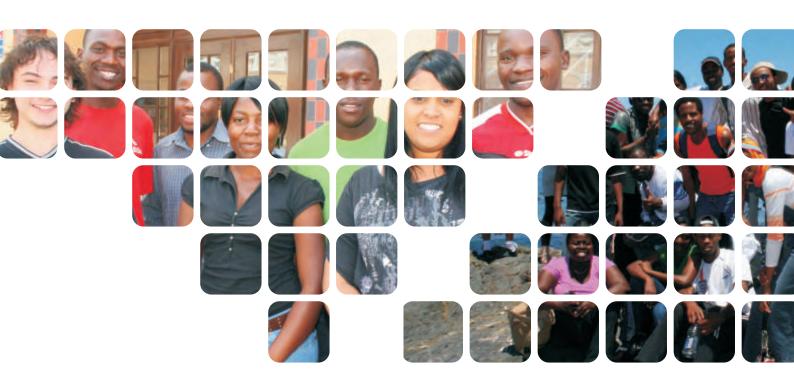


Courses towards BSc Honours in Mathematics with focus in Biomathematics

AIMS also offers courses towards a BSc Honours in Mathematics with focus in Biomathematics to South African students. Seven students who were registered at Stellenbosch University attended the courses listed below, which were taught at AIMS during the first half of 2010. The students were: Ms Linsay Blows, Mr Piet Jones, Mr Geoffrey Marutla, Ms Cynthia Mazinu, Mr Nelufule Nthatheni, Mr ThaiThai Sekgobela, and Mr Patrick Shabangu.

The five students who graduated from the programme in 2009 have all progressed to Master's degree studies at South African universities.

Period	Contact Lecturers Hrs		Course Title
25 Jan - 12 Feb	30	Ryszard Rudnicki, Silesia	Structured population models and their applications in genetics
22 Feb - 12 Mar	30	Wayne Delport, California, San Diego	Topics in Bioinformatics and Molecular Evolution I & II
8 Mar - 26 Mar	30	Sergei Pond, California, San Diego	Topics in Bioinformatics and Molecular Evolution I & II
5 Apr - 23 Apr	30	Aziz Ouhinou, AIMS / Clovis Noutchie, Stellenbosch	Ordinary and partial differential equations in Bioscience
26 Apr - 14 May	30	Farai Nyabadza, Stellenbosch	Non-linear dynamical systems in biomathematics
17 May - 4 Jun	30	Juliet Pulliam, Princeton	Topics from Biomedical Sciences



Extramural activities

During the course of the year, the students enjoyed the following extramural activities: barbeques and football games held at the local park, attendance at FIFA World Cup matches and events, African-theme dinners held at AIMS, birthday celebrations, hikes in the mountains, table tennis and a trip to Robben Island.

Associate Faculty

During 2009 AIMS appointed its first Associate Faculty members. Members were appointed for a period of four years on the basis of their significant contribution to AIMS through lecturing a course more than once, and through additional engagement in AIMS' activities. Members appointed to the AIMS Associate Faculty are:

Alan Beardon, University of Cambridge Alan Macfarlane, formerly University of Cambridge Barry Green, AIMS Bernd Schroers, Heriot-Watt University Carl Scheffler, University of Cambridge David Aschman, University of Cape Town Daya Reddy, University of Cape Town Ekkehard Kopp, University of Hull Grae Worster, University of Cambridge Jamshid Moori, University of KwaZulu-Natal Jan Govaerts, Catholic University of Louvain Jeff Sanders, UNU-IIST Kavilan Moodley, University of KwaZulu-Natal Kesh Govinder, University of KwaZulu-Natal Kristian Muller-Nedebock, Stellenbosch University **Neil Turok**, Perimeter Institute for Theoretical Physics Patrick Dorey, University of Durham Pedro Ferreira, University of Oxford Robert de Mello Koch, University of the Witwatersrand Tadashi Tokieda, University of Cambridge Tanniemola Liverpool, University of Bristol Vincent Rivasseau, Université de Paris-Sud XI



ProfileProfessor Vincent Rivasseau

Professor Vincent Rivasseau is an AIMS Associate Faculty member. Professor Rivasseau delivered a course on Advanced Real and Complex Analysis for four successive years on the AIMS Postgraduate Diploma programme. He also made a substantial contribution to AIMS by serving as the representative of the Université de Paris-Sud XI on the AIMS Council, and by initiating the AIMS-Senegal project.

Professor Rivasseau is a mathematical physicist specialising in constructive quantum field theory and renormalisation. He studied at the Ecole Normale Supérieure, Paris, and at Princeton University in the United States and has worked as a researcher in the Centre de Physique Théorique at Ecole Poytechnique. Since 2001, he has been a professor in the physics department of Université de Paris-Sud XI at Orsay, France.



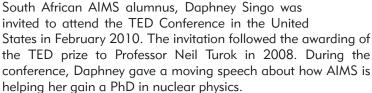


Alumni June 2010 marked the end of the 7th year of delivery of the

Postgraduate Diploma in the Mathematical Sciences. 54 students completed the Diploma during this year. The table below summarises the progress of students who have completed the programme at AIMS and for which

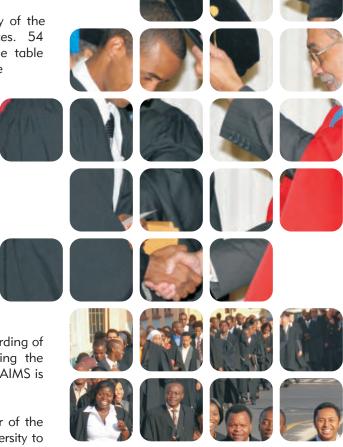
information is available.

Graduates from the AIMS PGD	305
Master's achieved after AIMS	120
PhD achieved after AIMS	15
Master's in progress after AIMS	110
PhD's in progress	114
Currently working in academia	47
Currently working in industry	21



In the first quarter of 2010, Professor Neil Turok (Chair of the AIMS Council), was approached by the Singularity University to nominate AIMS graduates, who would be considered to attend a short course at the university at NASA AMES in Silicon Valley from

19 June - 28 August 2010. The Singularity University is an interdisciplinary university whose mission is to assemble, educate and inspire a cadre of leaders who strive to understand and facilitate the development of exponentially advancing technologies in order to address humanity's grand challenges. Three AIMS alumni (Hind Ahmed, Mercy Njima, and Kidist Zeleke) were selected for the opportunity and provided with special grants to cover their travel, registration and living costs during the course.



Profile Dr Zakariya Mohamed

Dr Zakariya Mohamed was among the first intake of AIMS graduates in August 2003. He came to AIMS with a Master's in Statistics from the University of Khartoum. Zakariya completed his research essay on Epidemics on Scale-free Networks under the supervision of Gareth Witten. After completing the AIMS Postgraduate Diploma he enrolled for a PhD in Statistics at the University of the Western Cape. His research topic was: "Analysis and estimation of customer survival time in subscription based businesses." During his studies, Zakariya provided consultancy services to the University of Cape Town, the Cape Peninsula University of Science and Technology and the University of the Western Cape. After completing his PhD in 2009, Zakariya returned to Sudan where he was employed as the Head of the Department of Statistics in the Faculty of Mathematical Sciences, University of Khartoum. He is married and has one son.



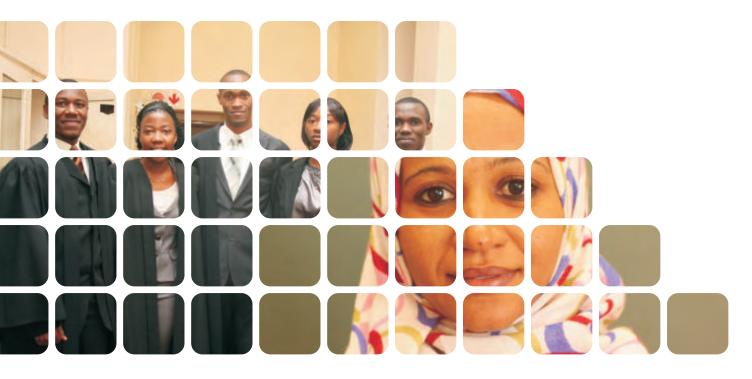
Destination of students 2009-10

		Origin	Destination	Programme
Agnes Ivy Bimpeh Harrison	Female	- 4 -	Returned home to Ghana	
Ahmed Mohamed Hassan Husien Hassan *	Male	_	Stellenbosch University	Master's
Alex Samuel Bamunoba *	Male	.	Stellenbosch University	Master's
Bruce Olivier Kindundu Dienda	Male	*/	Returned home to the Democratic Republic of Congo	
Bryan Garth-Davis *	Male		Stellenbosch University	Master's
Chika Ogochukwu Yinka-Banjo	Female		University of Cape Town	PhD
David Kwamena Mensah	Male	-	Returned home to Ghana	
Elinambinina Rajaonarifara *	Female		University of Cape Town	Master's
Emma Owusu Kwaakwah	Female	-	Returned home to Ghana	master 5
Enwere Pakith Aria Panzou-Pepe	Male		Paris, France	Master's
Eyaya Birara Eneyew *	Male		Stellenbosch University	Master's
Fadoua El Moustaid	Female	*	AIMS	Master's
Faikah Bruce *	Female		SACEMA, Stellenbosch	Master's
Faris Sied Ahmed Mohammed Osman	Male		Returned home to Sudan	Master 3
Franklin Djeumou Fomeni *	Male		University of the Witwatersrand	Master's
Gaelle Carine Mbanda Nsoungui *	Female		Stellenbosch University	Master's
Gezahegn Zewdie Abebe *	Male		University of KwaZulu-Natal	Master's
Gizat Derebe Amare	Male		Norwegian University of Science and Technology	Master's
Guy Olivier Ngongang Ndjawa	Male		King Abdullah University of Science and Technology	Master's PhD
auy Olivier Ngongang Najawa Hatson John Boscoh Njagarah *	Male	•	Stellenbosch University	Master's
-aatson John Boscon Njagaran ^ Hilaire Mambo Mobele *	Male	*/	University of Cape Town	Master's
	Female			Master's
Holifidy Arisoa Rapanoel *	Male		University of Cape Town	Master's
lean Frederic Isingizwe Nturambirwe *	Female		Stellenbosch University Stellenbosch University	Master's
leanne Marie Onana Eloundou *			·	
lissy Nsonde-Nsayi *	Male	•	University of KwaZulu-Natal	Master's
luliet Nakakawa *	Female	*	Stellenbosch University	Master's
_aila El Ghandour *	Female		Stellenbosch University	Master's
Lois Ama Adjei	Female		Returned home to Ghana	
Ludovic Tangpi Ndounkeu	Male	2	AIMS	Master's
Maurine Atieno Songa *	Female	2.3	University of KwaZulu-Natal	Master's
Michael Evrard Makouangou Ngouma *	Male		University of KwaZulu-Natal	Master's
Michael Oluwafemi Ajani	Male	*	Returned home to Ghana	
Mile Seitlheko	Male	*	Lecturing at University of Lesotho	
Mohamed Omari *	Male	*	Stellenbosch University	Master's
Mohammed Alhassan Babker Amany Kamblawe *	Female		Stellenbosch University	Master's
Mubarak Yagoub Adam Yagoub Yagoub *	Male		University of Johannesburg	Master's
Nagla Numan Ali Numan *	Female		Stellenbosch University	Master's
Nomenjanahary Alexia Raharinirina	Female		AIMS	Master's
Olufemi Opeyemi Olaoye *	Male		Stellenbosch University	Master's
Omowunmi Elizabeth Falola *	Female		University of Cape Town	Master's
Dyakhilome Wallace Ibhagui	Male		Erasmus Mundus	Master's
Paul Kibet Korir	Male	1	National University of Ireland, Galway	PhD
Prince Peprah Osei	Male		Returned home to Ghana	
Prosper Ngabonziza *	Male		University of Johannesburg	Master's
Rose Marie Liliane Amoa	Female		Returned home to Cameroon	
Siaka Lougue *	Male	*	University of the Western Cape	PhD
Solomon Akaraka Owerre	Male		Perimeter Institute and University of Waterloo, Canada	Master's
Suliman Mohamed Abdalla Jamiel *	Male		University of KwaZulu-Natal	Master's
Tahirivonizaka Fanirisoa Zazaravaka Rahantamialisoa	Male		AIMS	Master's
Folulope Rhoda Fadina *	Female		Stellenbosch University	Master's
Tovondrainy Christalin Razafindramahatsioro	Male		Université Pierre et Marie Curie, Paris	Master's
/iateur Tuyisenge	Male		University of Nice, France	Master's
Wafa Altuieb Mohammed Mustafa	Female		University of Khartoum	Master's
rusuf Nyonyi *	Male	•	University of KwaZulu-Natal	Master's
Students receiving half-bursaries from AIMS				
		<u> </u>	*	

Bursaries for study at South African universities

Bursaries for Master's study

Through the generous support of Google, Vodacom and Arcadia Trust, AIMS was able to offer matching half bursaries to its Diploma programme graduates who wished to pursue Master's studies at South African universities. In June 2010, 30 such bursaries were awarded to students who will be pursuing topics in mathematics (pure and applied), information technology, biomathematics, physics and engineering. These students are marked with an asterisk on the preceding page.



Bursaries for doctoral study

The German Academic Exchange Service (DAAD)/AIMS agreement became fully operational in its third year of existence during 2010. Its first cohort of supported doctoral students will reach the end of their three-year support period at the end of 2010. According to the agreement, five in-region scholarships are awarded annually to AIMS for PhD studies in Mathematics. During November 2009, nineteen applications were received from students in sub-Saharan Africa (excluding South Africa) of which ten were short-listed and sent to DAAD for final selection. DAAD generously granted six new scholarships for 2010 and provided support for the renewal of nine DAAD scholars selected in 2008 and 2009.

DAAD Awards for 2010

Gashaw Bekele Adera Stellenbosch University
Alnadhief Hamed Ahmed Alfedeel University of Cape Town
Olutayo Kehinde Boyinbode University of Cape Town

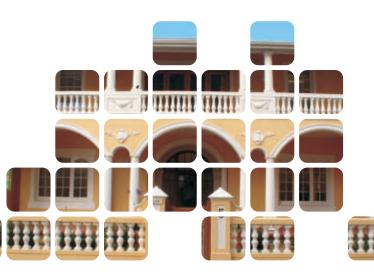
Tchilabalo Abozou Kpanzou Stellenbosch University

Badr Awad Elseid Mohammed University of the Witwatersrand

Ando Desire Razafindrakoto Stellenbosch University

Research at AIMS

AIMS is pleased to report that for the period under review, the Research Centre showed significant growth and has begun to play an important and stimulating role in the life of AIMS. The main funding received for the period under review, was a grant from the Department of Science Technology (DST) administered by the National Research Foundation (NRF). In addition, funds for research in biomathematics were received from Vodacom.



Substantial progress was made in the recruitment of staff. Two resident researchers, Dr Raouf Ghomrasni in mathematical finance and Dr Aziz Ouhinou in mathematical biology, were appointed on three-year contracts commencing 1 September 2009. Other appointments made were: Professor Ronald Becker (mathematical finance) appointed as a part-time Senior Researcher from 1 August 2009; and Clovis Oukouomi Noutchie (biomathematics) jointly appointed as a part-time researcher with Stellenbosch University from 1 August 2009. Professor Alan Beardon has continued his involvement at AIMS as an Honorary Research Fellow. Professor Bruce Bassett has been seconded from the University of Cape Town (UCT) (where he holds a 50% position) and appointed at AIMS as a Senior Researcher from 1 July 2010. He will initiate research activities in astrophysics and cosmology at AIMS. Dr Mervin Varughese, who is a Lecturer in the Department of Statistics at UCT, is part of the research group which Professor Bruce Bassett has brought with him from UCT.

The visitors' programme has been particularly successful. As AIMS has a Pan-African focus the majority of visiting researchers came from Africa. Most of them were at AIMS for periods of about two months. The researchers listed below visited AIMS during the period 1 August 2009 and 31 July 2010.

Name of visitor	Research Field	Period of visit
Senelani Dorothy Hove-Musekwa , National University of Science and Technology	Modelling of Biomedical Systems, Biomathematics, Mathematical Epidemiology	1 June 2009 to 31 May 2010
Mamadou Sango, University of Pretoria	Stochastic Partial Differential Equations	3 to 11 July 2009
Conrad Tabi, University of Yaounde	Condensed matter, Physics (Biophysics)	16 July to 16 September 2009
Shazrene Mohamed, Oxford University	Modelling Binary Stars, Astrophysics	17 August to 16 October 2009
Moussa Balde, Université Cheikh Anta Diop	Control Theory, Switch Systems	18 August to 15 October 2009
Jean-Baptiste Gatsinzi, University of Botswana	Algebraic Topology	1 September to 30 November 2009
Semu Mitiku Kassa, Addis Ababa University	Biomathematics, Operations Research	1 September 2009 to 31 August 2010
Abdelhai Elazzouzi, Cadi Ayyad University	Partial functional differential equations, Mathematical Modelling and Dynamical	7 September to 18 October 2009
	systems, Numerical Analysis of PDEs, Control Theory	
Yaozhong Hu, University of Kansas	Probability, Statistics, Stochastic Control, Mathematical Finance	6 December 2009 to 17 January 2010
Okey Oseloka Onyejekwe, Florida Institute of Technology	Computational Fluids and Heat Transfer	19 January 2010 to 18 April 2010
Olubunmi Abidemi Fadipe-Joseph, University of Ilorin	Complex Analysis: Univalent Functions Theory	23 January 2010 to 23 March 2010
Shaban Mbare, University of Dar Es Salaam	Biomathematics, Epidemics on Networks	1 February 2010 to 31 March 2010
Philibert Nang, University of Franceville	Algebraic analysis: D-modules, perverse sheaves	17 February 2010 to 16 March 2010
Elzain Gumma Elzain Ahmed, International University of Africa	Implementation of efficient algorithms for derivative free optimisation	21 February 2010 to 21 May 2010
Papa Ngom, Université Cheikh Anta Diop	Spacial Statistics and Bayesian Analysis	19 July 2010 to 2 September 2010

The vibrant seminar series (called the Journal Club) has continued during the period under review, and the frequency of presentations has been increased from once a fortnight to once a week. Resident and visiting researchers, postdoctoral fellows and research students meet once a week to present their own or other interesting work to a broader audience.



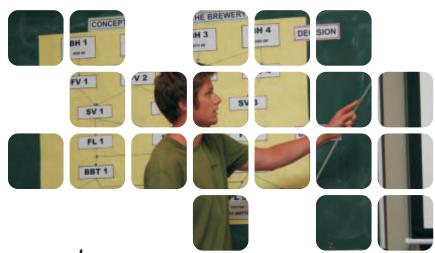
Seven Master's and one doctoral student were registered/renewed their registration at local universities to conduct research at AIMS while five postdoctoral fellows pursued their research at AIMS during the period under review (see tables below). All these students are registered at Stellenbosch University.

Master's and doctoral students in the AIMS Research Centre

Student	Research Field	Supervisor(s)	Comments					
Amsalework Ejigu	Biomathematics	Dr A Ouhinou, Profs FJW Hahne & J Hargrove	Commenced master's studies in June 2009					
Lydienne Matchie	Mathematical finance	Dr R Ghomrasni	Commenced master's studies in July 2009 and submitted Master's thesis in June 2010					
Nicole Flaure, Kouemo Tchamga	Mathematical finance	Dr R Ghomrasni	Commenced master's studies in July 2009 and submitted Master's thesis in June 2010					
Dephney Mathebula	Biomathematics	Dr C Oukouomi Noutchie	Registered for master's study in January 2010					
Andriamihaja Ramanantoanina	Biomathematics	Dr A Ouhinou, Dr C Hui	Registered for PhD in February 2010					
Ludovic Tangpi Ndounkeu	Mathematical finance	Dr R Ghomrasni	Registered for master's study in July 2010					
Alexia Raharinirina	Biomathematics	Dr A Ouhinou	Registered for master's study in July 2010					
Fadoua El Moustaid	Biomathematics	Dr A Ouhinou	Registered for master's study in July 2010					

Postdoctoral fellows in the AIMS Research Centre

Fellow	Research Field	Start Date - End Date
Aziz Ouhinou	Partial differential equations with delay, Epidemiology of infectious diseases	1 August 2008 – 31 July 2010
Gift Muchatibaya	Industrial Mathematics, Analysis of a three dimensional unsteady contact melting model with a constant heat flux	1 January 2009 – 31 October 2009
Hermane Mambili-Mamboundou	Lie group analysis of differential equations, Delay differential equations from Biology, Epidemiology	1 January 2009 – 31 December 2010
Cedrick Kitio-Kwuimy	Modelling and non-linear dynamics of engineering systems	1 August 2009 – 31 July 2011
Lafras Uys	Modelling fluid flow coupled to biochemical reaction networks, Differential Equations	1 January 2010 – 31 December 2011



Other postgraduate students

Postgraduate students of Dr Raouf Ghomrasni and Professor Ronald Becker visited AIMS during the year and made use of the AIMS facilities. These were: Olivier Menoukeu-Pamen (PhD student, Dr Ghomrasni); Dale Biddulph, Mamello Chopho, Samantha Jones, Christopher Linley, Tawanda Mbengeranwa, Kaibe Mmokoma, Ariel Zadikov (Master's students, Professor Becker); and Farai Mhlanga (PhD student, Professor Becker). In addition, the following postdoctoral fellows and postgraduate students have joined Professor Bruce Bassett at AIMS from July 2010: Caroline Odman, Mathew Smith, Marco Regis, Petja Salmi (all at postdoctoral level), Patrice Okouma (doctoral student), Bryony Martin, James Newling (Master's students) and Michelle Knights at Honours level. Master's student Eugene Mutiti (National University of Science and Technology, Zimbabwe) came to AIMS for a month in February 2010 to work under supervision of Professor Becker on the mathematical finance component of his studies.



AIMS researchers attended workshops and conferences elsewhere:

Cedrick Kitio Kwuimy participated in the workshop "Entrepreneurship for Physicists and Engineers from Developing Countries in Africa" from 9 to 13 November 2009 at Ithemba LABS.

Aziz Ouhinou, Semu Kassa, Clovis Noutchie, Hermane Mambili-Mamboundou and Amsalework Ejigu attended the African Society for Biomathematics Conference in Stellenbosch from 23 to 26 November. Semu, Hermane and Aziz gave presentations which were entitled, respectively, as follows:

- Optimal Resource Allocation for HIV Prevention Programmes: A Model for Hierarchical Decision Making Systems.
- Modelling hospitalisation, home-based care and individual withdrawal for people living with HIV/AIDS in high prevalence areas.
- Stability Analysis of the Observed Pattern in Avascular Solid Tumour Growth.

Aziz Ouhinou and Hermane Mambili-Mamboundou attended the Conference on Computational and Mathematical Population Dynamics in Bordeaux from 31 May to 4 June 2010 where they gave presentations entitled, respectively:

- Spatial Patterns of Solid Tumour in Avascular Stage; Modelling and Mathematical Analysis.
- Modelling hospitalisation, home-based care and individual withdrawal for people living with HIV/AIDS in high prevalence areas.

Barry Green attended the Field Arithmetic Conference, Tel Aviv University from 13 to 17 June, where he presented an invited talk:

• On the number of automorphisms of curves over algebraically closed fields.



Outreach activities have been recognised as an important component for the successful integration of the AIMS Research Centre into the South African mathematical community. Consequently, an extensive tour of South African universities, which commenced in the previous reporting year, was undertaken by Profs Fritz Hahne, Barry Green and Alan Beardon. The purpose of these visits was to inform staff and students about how they could benefit from the programmes and activities at AIMS. Historically disadvantaged universities were specifically targeted and other universities were included where feasible. The following universities were visited during the period under review:

- University of Johannesburg (3 August 2009)
- University of Limpopo in Polokwane (5 August 2009)
- University of Venda (6 Aug 2009)
- North West University in Potchefstroom (12 August 2009) and North West University in Mafikeng (13 August 2009)
- Nelson Mandela Metropolitan University (24 August 2009)
- Rhodes University (25 August 2009)
- University of Fort Hare (26 August 2009)
- University of the Free State (27 August 2009)
- University of Pretoria (27 October 2009)

In February 2010, Professor Beardon presented a talk on "Advice to Postgraduate Students" at Stellenbosch University which about 35 people attended. Furthermore he convened a workshop "Communicating Mathematics" at Stellenbosch University on 19 February 2010.



Publications

Research Papers

The following research papers based on work completed at AIMS, have been published:

- CB Tabi, A Mohamadou and TC Kofané. Modulated Waves in the DNA Double Helix with Finite Stacking Enthalpy.
- Journal of Bionanoscience, 3(2) (2009), 110-117.
- Ghomrasni R. A generalised occupation time formula for continuous semimartingales. Studia Sci. Math. Hungar., 47(1) (2010), 54-58.
- Ghomrasni R and Menoukeu Pamen O. Decomposition of order statistics of Semimartingales using local times.
- Stochastic Analysis and Applications, 28 (2010), 1-13.
- Kitio Kwuimy CA, Nana B and Woafo P. Experimental bifurcations and chaos in a modified self-sustained macro electromechanical system. Journal of Sound and Vibration, 32 (2010), 3137-3148.
- Chiyaka C, Mukandavire Z, Das P, Nyabadza F, Hove-Musekwa SD and Mwambi H. Theoretical analysis of mixed Plasmodium malariae and Plasmodium falciparum infections with partial cross immunity. Journal of Theoretical Biology, 263 (2010), 169-178.
- Sidi Ammi MR and Torres DFM. Hölder's and Hardy's Two Dimensional Diamond-alpha Inequalities on Times Scales, An. Univ. Craiova. Mat. Inform., 37(1) (2010), 1-11.
- Elazzouzi A and Ouhinou A. Variation of constants formula and reduction principle for a class of partial functional differential equations with infinite delay. Nonlinear Analysis, 73, (2010), 1980 – 2000.
- Tabi CB, Mohamadou A and Kofane TC. Modulational instability in the anharmonic Peyrard-Bishop model of DNA.
 European Physical Journal B, 74 (2010), 151-158.
- Zdravkovic S and Tabi CB. Two possible approaches in Peyrard-Bishop-Dauxois model of DNA dynamics. Journal of Computational and Theoretical Nanoscience, 7(8) (2010), 1418 – 1424.
- Oukouomi Noutchie SC, Existence and uniqueness of conservative solutions for nonlocal fragmentation models.
 Mathematical Methods in the Applied Sciences Journal, DOI:10.1002/mma.1302.

The following research papers have been accepted for publication.

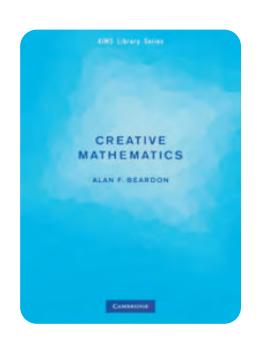
- Tabi CB. Energy Localization in an Anharmonic Twist-opening Model of DNA Dynamics. Journal of Physics: Condensed Matter.
- Becker RI, Lari I, Ricca F and Scozzari A, Locating Median paths on Connected Outerplanar Graphs. Networks, in press.
- Magombedze G, Nduru P, Bhunu CP and Mushayabasa S. Mathematical modelling of immune regulation of type 1 diabetes.

Books

The first two books in the AIMS Library Series have been published. The books, which each focus on a particular field in pure or applied mathematics, aim to both introduce the field, and to inspire advanced interest. The series seeks to address the shortage of affordable mathematics textbooks in Africa. The following titles have been published through Cambridge University Press, under the editorial leadership of Professor Alan Beardon:

- Creative Mathematics (Alan F Beardon)
- Understanding Fluid Flow (Grae Worster)

A further book has been accepted for publication, and two manuscripts are currently being reviewed.



AIMS-Next Einstein Initiative

The AIMS-Next Einstein Initiative (AIMS-NEI) has made significant progress over the past year.

Secretariat: AIMS-NEI has been registered as a trust in the United Kingdom and is represented by an international Board of Directors whose members are:

- Professor Neil Turok (Chair) Director of the Perimeter Institute for Theoretical Physics (Canada).
- Professor Francis Allotey Director of the Institute for Mathematical Sciences (Ghana).
- Professor Howard Alper Chair of Canada's Science, Technology and Innovation Council (Canada).
- Professor Russel Botman Vice-Chancellor of the University of Stellenbosch (South Africa).
- Professor Barry Green Director of AIMS-South Africa (South Africa).
- Professor Keith Moffatt Department of Applied Mathematics and Theoretical Physics, Cambridge (UK).
- Professor Fernando Quevedo Director of the International Centre for Theoretical Physics (Italy).
- Professor Mamadou Sanghare Head, Doctoral School for Mathematics and Computer Science, Université of Cheikh Anta Diop, Dakar.



AlMS-NEI received substantial grants from the Google Inc. Charitable Giving Fund of Tides Foundation and from the Government of Canada which committed 20M Canadian Dollars over a 4-year period. These funds will be used for the establishment of the next three centres in the AlMS network which are planned to open by 2013 in Senegal, Ghana and Ethiopia. Canadian Prime Minister Stephen Harper made the announcement in July at the Perimeter Institute in Canada and said, "History shows that our world becomes safer, healthier and more stable through advances made in science and technology. Humanity's ascent from ignorance and barbarism to enlightenment and equality has been a fitful and uneven process. If there is, however, a universal constant in human affairs, it is that the expansion of knowledge and technology has continuously made life better for more people. That's why our government is supporting scientific and technological research, as well as development at home and abroad."

Sénégal: H.E. President Abdoulaye Wade has committed €1M of funding and a parcel of land to the AIMS-Sénégal project to enable construction. The first stage of architectural drawings have been completed, and construction is planned to commence early in 2011. The institute has identified its first Director (Professor Mamadou Sanghare of the Université Cheikh Anta Diop) and plans to accept its first intake of students in September 2011. AIMS-Sénégal will be located in MBour, 80km south of Dakar in a picturesque seaside ecological reserve.

Ghana: The AIMS-Ghana project has started regular steering committee meetings involving representatives from the universities at Legon, Cape Coast and Kumasi, as well as international partners from the Universities of Heriot-Watt, Durham and the Western Cape. Thanks to strong Ghanaian and international support, the first intake of students is planned to start at AIMS-Ghana in September 2012 in a new purpose-built facility.

Ethiopia: Initial planning meetings will start soon and will build on previous fruitful discussions with Ethiopian and international academics.



AIMS Schools Enrichment Centre



The goal of the African Institute for Mathematical Sciences Schools Enrichment Centre (AIMSSEC) is to empower teachers through the Aiming High Teacher Network and professional development courses which bring new skills and excellence to teaching and learning mathematics in Africa. AIMSSEC runs two types of professional development courses for mathematics teachers based on a blended-learning approach: the preliminary, three-month Mathematical Thinking (MT) course, and the two-year Advanced Certificate in Education (ACE) course. Visiting lecturers from around the world teach on these courses, introducing perspectives on teaching and learning mathematics which reflect commonly agreed good practice worldwide. The management of the courses and all the distance teaching is carried out by Barrie Barnard and Toni Beardon. Najwa Chellan was appointed as the new administrative officer for AIMSSEC in July 2010, and there are plans to expand the team in the near future.

The AIMSSEC Mathematical Thinking course has been run fourteen times for a total of 682 teachers and subject advisers (primary and secondary) from all parts of South Africa. In January and July 2010, AIMSSEC ran the residential component of the courses with sixty-five hours of face-to face mathematics workshops followed in each case by three months distance learning. The course focuses on subject knowledge, and teachers write a mathematics exam at the end of the residential unit. Computer skills taught include the use of free software in teaching mathematics. A learner centred, activity-based-approach to teaching is encouraged with an emphasis on understanding and a shift away from 'chalk and talk' and rote learning. Teachers are subsequently required to submit two assignments based on how they have put into practice what they have learnt on the course.



The AIMING HIGH Teacher Network encourages teachers to support each other with a commitment to lifelong learning and a love of mathematics. Through this network teachers can exchange ideas with the AIMSSEC community and have their mathematical queries answered through the Moodle Online Course Management which can be accessed by cellphone or online. Plans are underway to conduct teacher workshops by Interactive Telematic TV broadcasts and to bring together groups of teachers to share the AIMING HIGH workshops in centres in Polokwane, Richard's Bay, Durban, Klerksdorp, Mthatha, East London and Stellenbosch. The preliminary Mathematical Thinking course is a pre-requisite for the two-year Advanced Certificate in Education (ACE) professional development programme designed by AIMSSEC to train mathematics subject leaders particularly in rural areas. This programme, launched in January 2009 and accredited by Stellenbosch University as an NQF level 6 qualification, can readily be adapted to comply with any new regulations for teacher professional development. It is an innovative technologyenhanced programme taught by AIMSSEC in collaboration with the Institute for Mathematics and Science Teaching of the University of Stellenbosch (IMSTUS). During January 2010 residential courses were provided for 45 first-year students and 33 second-year students. The students are guided in their studies by the lecturers who answer their questions through the Moodle Online Course Management system. The teachers submit regular assignments and write examinations each year. In addition, they attend workshops in their own areas which are broadcast from Stellenbosch on the Interactive Telematic Education TV system.

AlMSSEC invited Professor John Mason from the Open University to run a workshop in Stellenbosch in January 2010. The theme was "Reflecting on your own practice" and lecturers attended from the Universities of Cape Town, Stellenbosch, Pretoria, Auckland, Brunei, Cambridge and Kent.

The Eastern Cape Education Department (ECED) has commissioned AIMSSEC to train 276 mathematics subject leaders from 23 Eastern Cape school districts over the next four years. The ECED is providing bursaries for the teachers to enable them to take up leadership positions in their areas. AIMSSEC has entered into a partnership agreement with the Faculty of Education of the University of Fort Hare which is ideally suited to conduct the proposed programme. The partnership will bring together the knowledge and experience of international and local academics in mathematics.

Visit: http://aimssec.aims.ac.za

education and teacher education. The teachers will be registered at the University of Fort Hare, with the first cohort of 75 starting in January 2011 and cohorts of 120 in the following years. Teachers from other provinces will be admitted once the project has trained all the required subject leaders in the Eastern Cape.

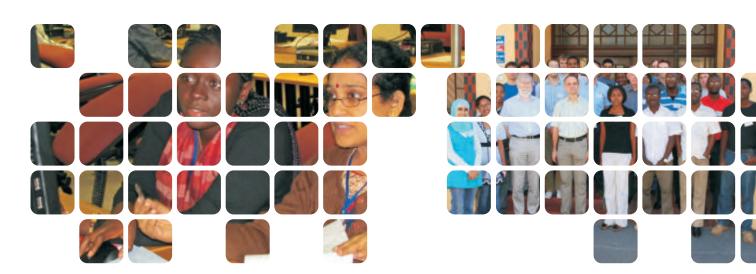
AIMSSEC has continued assisting primary school learners to visit the MTN Sciencentre for video-conference sessions with schools in the United Kingdom. Saturday Mathematics Enrichment classes for grade 10 and 11 learners continued this year, and AIMSSEC has linked up with the Meraka Institute's Dr Math project to answer mathematical questions from learners through the MXit social networking system.



Courses and Conferences

The following courses and conferences were held during the period under review:

From 8 to 11 December, Yaozhong Hu gave a series of lectures on Rough Path Analysis to researchers and research students from AIMS, Stellenbosch University, University of Cape Town and the University of Venda.



The **7th Mathematics in Industry Study Group (MISG)** in South Africa was held at AIMS from 11 to 15 January 2010. It was preceded by a preparation session for graduate students from 6 to 8 January led by Professor David Mason (University of the Witwatersrand). During the MISG, academic staff (13 from seven universities), graduate students (28 from the Universities of the Witwatersrand, North-West and South Africa, as well as AIMS) and three postdoctoral fellows worked on problems submitted by industry. Delegates continued with their work after the MISG, and the results will be published in a full technical report on each problem. Eight problems (addressing aspects of medical imaging, hydrofoil, wind turbine, instrumentation for aerobatic competitions, position emission, image recognition, stochastic estimation and biotechnology) were submitted. Invited foreign academics assisted in the sessions.

The 4th workshop in the **Joint Exchange and Development Initiative (JEDI)** series was held at AIMS from 24 to 30 January 2010. This workshop focussed on teaching key research skills to South African, African and international students, examining new methods of research, encouraging new national and international research collaborations and research networks and developing novel strategies for research success in a rapidly changing world. It was attended by 18 researchers and postgraduate students from the universities of Cape Town, KwaZulu-Natal, ICG Portsmouth, Sussex, SAAO/UCT and Claudia Quercellini University of Roma II.

The **3rd Summer School in Mathematical Finance** was held at AIMS from 18 to 20 February 2010. Lecture topics were: Convex duality systems in mathematical finance; Market impact modelling, price manipulation an optimal trade execution; and Computational issues in derivatives pricing. Sponsorships from Standard Bank, Financial Chaos Theory and Cadiz supplemented NRF/DST funds. The workshop was attended by practitioners, academics and postgraduate students. Fifty-six delegates attended with good representations in each of the three groups.

On 12 February 2010 Professor Alan Beardon facilitated a whole day interactive workshop on Communicating Mathematics at AIMS which about 20 people attended. It was designed to explore ways on how to improve presentations and research papers.

Professor Beardon also arranged a workshop at AIMS on Complex Analysis and Related Topics on 25 and 26 February 2010 where several participants made presentations. Lectures were on complex analysis, hyperbolic geometry, continued fractions and the orthogonal group.

From 13 to 17 July AIMS hosted an international conference entitled Diversity in Mathematics. The aim of this conference was to emphasise the beauty of mathematics and the diversity of research in mathematics and its applications. There were plenary talks, invited talks and panel discussions which elicited lively debate on a number of issues. More than 80 academics, researchers and students took part in the conference with students comprising just under half of this number.

During the last two weeks of July, AIMS hosted the African School series on Electronic Structure Methods and Applications (ASESMA). This is the second time AIMS has hosted the school, and the workshop brought together even greater, and more diverse levels of expertise among its lecturers and participants. One of the primary objectives of the school was to introduce participants to the open-source software Quantum Espresso Codes, which can be used in the development of new materials. The school featured lectures on solid state physics and materials science theory, and algorithms which underpin the software, as well as presentations on research topics where the software can be utilised.

Networking

In February 2010, AIMS hosted a visit by Professor Luc Vinet, Rector of the Université de Montréal. The purpose of the visit was to hold discussions with a view to signing a memorandum of understanding on areas of cooperation between the two institutions. This memorandum has subsequently been signed.

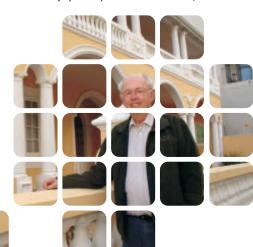
In July 2010, Professor Neil Turok (AIMS Council chair), Professor Daya Reddy (AIMS Council) and Professor Barry Green (AIMS Director) met with the Minister of Higher Education and Training, Dr Blade Nzimande, to discuss ongoing and new areas of cooperation. Professor Green also attended a meeting with the Council for Scientific and Industrial Research in which a draft memorandum of understanding was agreed upon.

Special Events

Professor Jean-Pierre Ezin, Commissioner for the African Union (AU) with the portfolio of Human Resources Science and Technology, visited AIMS in August 2009. He presented a public lecture on the AU's plans to establish a Pan-African University.

Cambridge University Press (CUP) celebrated the launch of the AIMS Library Series at a special event at AIMS in October 2009. Stephen Bourne, CEO of CUP, addressed the gathering and Professor Alan Beardon, author of the first title in the series, spoke about how the series was conceptualised. The event was enjoyed by AIMS students, staff and other visitors.

Professor Fritz Hahne, Director of AIMS since its inception in 2003, retired at the end of March 2010. He was bid a fond farewell by students, alumni and colleagues at a special lunch held at AIMS. His deep affection for the students and his commitment to the development of young African scientists was recognised by all present at the occasion. Professor Hahne was instrumental in the establishment of AIMS, and oversaw the successful graduation of 252 students from the Postgraduate Diploma Programme.





Ten AIMS students were among a group of eighty young Africans invited to meet with The Elders in Johannesburg on 29 May. Originally brought together by Nelson Mandela in 2007, The Elders are eminent global leaders who no longer hold public office. The group includes Martti Ahtisaari, Kofi Annan, Ela Bhatt, Lakhdar Brahimi, Gro Brundtland, Fernando Henrique Cardoso, Jimmy Carter, Graça Machel, Mary Robinson and Desmond Tutu. Nelson Mandela and Aung San Suu Kyi are honorary Elders. The meeting aimed to harness some of the energy and excitement generated through the hosting of the FIFA World Cup in South Africa, and the students were able to offer their suggestions on how to tackle the challenges facing the African continent.







Seminars

November 2009

- Professor Aziz Yakubu, Howard University, Washington: Mathematical Models in Ecology and Epidemiology.
- Dr Aziz Ouhinou, AIMS: How to prove Picard's theorem.
- Professor Paul Woafo, University of Yaounde I: General information on Research interests of the group on Modelling and Simulation in Engineering and Biological Physics of Cameroon.

January 2010

Professor Neil Turok, Perimeter Institute for Theoretical Physics: The Magic of Basic Science and AIMS for Africa.

February 2010

- Mr Klebert Kentia, Berlin Mathematical School: No-Good-Deals via Optimal Expected Growth Rate.
- Mr Huygens Ravelomanana, University of Cape Town: Heegaard Floer Homology.

March 2010

- Professor Kesh Govinder, KwaZulu-Natal: A Symmetric View of Life.
- Dr Jeff Sanders, UNIIST, Macao: Coins, mobile phones and quantum computing.

April 2010

 Professor Andrew Macnab, British Columbia: Mathematics: "the door and the key" to clinical diagnosis in medicine? Lessons from Near Infrared Spectroscopy (NIRS).

May 2010

- Dr Hussein Mouftah: Advances in Wireless Sensor Networks, and Wireless Sensor Networks for Smart Grid Applications.
- Professor David Balduzzi, Max Planck Institute: What can a neuron do for its brain?
- Dr Senelani Dorothy Hove-Musweka, NUST Bulawayo: Cost effectiveness analysis of hospitalisation and homebased care for people living with HIV/AIDS in high prevalence settings.
- Dr Senelani Dorothy Hove-Musweka, NUST Bulawayo: Modelling the effects of treatment on chronically HIVinfected patients.

Visitors to AIMS

September 2009

Delegation of senior members of the Thurgood Marshall College Fund.

October 2009

Mr Stephen Bourne, CEO of Cambridge University Press.

November 2009

Professor Hunt, Witwatersrand. Professor Vladimir Bajic, KAUST. Mr Eran Davidson, Hasso Plattner Ventures.

February 2010

Professor Jef Teugels, KUL Belgium and President of the International Statistical Institute (ISI). Professor Tertius De Wet, Head of Statistics at Stellenbosch University. Professor Luc Vine, Rector of the Université de Montréal.

March 2010

Ms Patricia Ehrnman, United States Department of State. Dr David L. Charney, United States.

April 2010

Mr Antoine Michon, French Consulate, Cape Town.

AIMS Governance

AIMS Council and AIMS Trust

The AIMS Council met on 8 January 2010. The meeting served simultaneously as the meeting of the members of the AIMS Trust. A further Trust meeting was held after the Council meeting to discuss amendments to the Trust deed.

Council members are drawn from the six participating universities, currently these are Professor Jan van Bever Donker (University of the Western Cape), Professor Hendrik Geyer (Stellenbosch University), Professor Daya Reddy (University of Cape Town), Professor Keith Moffatt (University of Cambridge), Professor Graham Richards (Oxford University), Dr Tsou Sheung Tsun (Oxford University), Professor Stephane Ouvry (Université de Paris-Sud XI) with Professor Neil Turok (Perimeter Institute) as Chair, and the Director of AIMS, Professor Barry Green, as an ex-officio member. The AIMS Trust, a registered charitable trust, has the following trustees: Professor Jan van Bever Donker, Professor Neil Turok, Professor Fritz Hahne, Professor Daya Reddy and Professor Keith Moffatt. During 2010 two new trustees were appointed namely Professor Russel Botman and Professor Ben Turok.

AIMS Advisory Board

The AIMS Advisory Board advises on strategic and academic aspects of the AIMS programme, in particular its integration with existing courses and research projects in South African and other African universities. It met on 26 May 2010. Its current members are Professor Edward Lungu, (University of Botswana) as Chair, Professor Jacek Banasiak (University of KwaZulu-Natal), Professor Kathy Driver (University of Cape Town), Professor Barry Green (AIMS), Dr Sizwe Mabizela (Rhodes University), Professor Peter Martinez (South African Institute of Physics), Dr Thandi Mgwebi (NRF), Professor David Sherwell (University of the Witwatersrand), Dr Sibusiso Sibisi (Council for Scientific and Industrial Research), Professor Arnold van Zyl (Stellenbosch University), Professor Hlengani Siweya (South African Mathematical Society) and Professor Patricia Whitelock (South African Astronomical Observatory).







AIMS Executive Team

Professor Francis Benyah (University of the Western Cape), and Dr Kristian Müller-Nedebock (Stellenbosch University) continued to serve on the the AIMS Executive Team (AET), while Professor Vasco Brattka (University of Cape Town) was replaced by Dr David Gay who in turn was succeeded by Dr Mark Berman. Members of the AET assisted the Director of AIMS with DAAD applications and the selection of students for the postgraduate diploma programme. The AET's additional role is to facilitate the relationship between AIMS and the three participating South African universities.



Staff

Four new staff members commenced duty at AIMS during the period under review: Barry Green took over from Fritz Hahne as Director of AIMS on 1 April 2010; Fazley Jattiem joined Igsaan Kamalie and Emmanuel Kongolo in the Logistics and Facilities division; Thabo Ntitsane joined the ICT Manager, Jan Groenewald, as IT support technician in May 2010; and Najwa Chellan was appointed in July 2010 to take over AIMSSEC's administration from Liesl Jones. Frances Aron continued as the English teacher; Deborah Wilsnagh continued in the Financial/HR division with A'eeda Mpofu, Liesl Jones, Gudrun Schirge and Lynne Teixeira in Administration.



Tutors

AIMS appointed a number of teaching assistants to assist the visiting lecturers and the AIMS Director with the postgraduate diploma course and the Honours course in Biomathematics. They were Gashaw Bekele Adera (Ethiopia), Hind Ahmed (Sudan), Trust Chibawara (Zimbabwe), Madeleine Cule (United Kingdom), Oluwasola Mary Fasan (Nigeria), Gaston Kuzamunu Mazandu (DR Congo), Felix Oghenekohwo (Nigeria), Andry Nirina Rabenantoandro (Madagascar), Andriamihaja Ramanantoanina (Madagascar) and Dimbinirina Ramarimbahoaka (Madagascar).



Information technology

The AIMS IT department continued to provide support to all the programmes at AIMS as well as undertaking some new projects. The new AIMS website was developed during 2009 and launched after the January 2010 AIMS Council meeting. The site deploys a modern design by Scribblers Club. The new content management system allows administrative staff members to update the website. During 2010, a new website for AIMSSEC was modelled on the AIMS site and is expected to be launched in late 2010. The AIMS-Next Einstein Initiative website will also migrate to the same reliable virtual servers at Frogfoot Networks.

In 2009-10 the IT department's support work expanded to include a free Ubuntu Linux installation on visiting laptops. Over 100 laptops were installed during the period under review.

IT staff continued assisting with the delivery of the academic programmes at AIMS, in particular providing support for computational software used in the postgraduate diploma programme courses. Special support is provided for the use of SciPy, SAGE, and LaTeX. During the diploma programme, the courses "Computing and LaTeX", and "Ubuntu Linux installation for Scientists" were offered by the ICT Manager, Jan Groenewald.

Alfred Mahlangu left the AIMS IT department in February 2010 and Thabo Ntitsane from the National University of Lesotho (NUL) joined AIMS as IT Support Technician on a six-month contract. While assisting AIMS, he will also look at



ways to strengthen existing ties between AIMS and NUL and investigate technologies to take home and implement there.

A new IT office has been identified and renovations are underway. The new space will facilitate effective teamwork and focus. A small backup server room has been developed for redundancy. When the new file servers are deployed, their data will replicate in this room, and automatic failover technologies will be investigated. Off-site backups which will take place quarterly, have also been introduced. In October 2009, South African universities switched to the SEACOM cable for international access, reducing the international bandwidth price slightly. The last mile on a Neotel Microwave link currently limits AIMS' utilisation of South African National Research Network (SANReN), and alternatives are being investigated.

Facilities

The Facilities Department managed a number of renovation projects during the period under review: six existing bathrooms were renovated and two additional bathrooms constructed, with geyser management installed to reduce electricity consumption. The exterior of the Watson Street property was painted, and the dining and serving areas of the main building were revamped. Future plans include the creation of a recreational area for students. Fazley Jattiem was appointed as Assistant in Facilities, to meet the growing demands on the department.

STELLENBOSCH UNIVERSITY AIMS R028

Financial Statement for the year ended 31 December 2009

	TOTAL	GENERAL OVERHEAD COSTS	PGE PROGRA BURSA	MME	ACADEMIC PROGRAMME	POST AIMS BURSARIES	PR	ONOURS OGRAMME URSARIES		ESEARCH OGRAMME		NDOWED IOLARSHIPS		XT EINSTEIN IITIATIVE & AMINET		PRIOR YEAR 31/12/2008
TOTAL INCOME	R 19,021,840.52	R 4,692,598.35	R 5,205,	799.41	R 6,595,000.00	R 2,115,303.00	R	75,000.00	R	120,000.00	R	218,139.76	R_			19,137,609.0
Andrews Anglo America Chairmans Fund	R -			1											R	15,155.8
nonymous	R -			1											R	39,538.
rcadia Trust	R 3,215,566.50		R 2,028,	763.50		R 1,186,803.00									R	2,238,960.
very Tsui Foundation	R -														R	3,240,663. 118,614.
very Tsui Foundation arclays PLC	R - 1,593,216.13		R 1,593,	216 13											R	1,992,472.
vers Family	R -		1,555,	210.13											R	2,675,619
ambridge University Press	R 322,164.00		R 322,	164.00											R	382,027
ynthia & George Mitchell Foundation	R 185,615.37		R 185,	615.37												10.1.105
AAD epartment of Education (2008/09 & 2009/10)	R 808,500.00 R 6,595,000.00				R 6,595,000.00	R 808,500.00	1								R	434,485.
epartment of Education (2006/09 & 2009/10)		R 1,622,807.02			K 0,383,000.00										R	877,192
preign Exchange Profit		R 4,825.06													R	2,241
and Drum Rhythms	R 28,263.75		R 28,	263.75							1				-	00.407
CIAM	R -										ł	- 1			R	23,137 219,600
le of Man Government (Overseas Aid Committee) Kellner	R -										l				R	303,561
ondon Mathematical Society	R -										l	- 1			100	7574760
prenz	R -														R	158,152
artin Rees (Endowed Scholarship)	R 75,000.00			00.000												
eil Turok	R 104,859.49		R 104,	859.49											R	1,019,905
eil Turok (Sapling Foundation) ew Star Asset Management	R -										ĺ				R	75,686
ITHeP	R -														R	170,260
okia	R -														R	331,556
Kellner	R -														R	12,838
aris-Sub University ACEMA	R - 75,000,00						R	75,000.00							R	140,000
tephen Hawking (Endowed Scholarship)	R 75,000.00		R 75,	00.00			1	,			ĺ				- 1	
undry Income	R 230,445.07			445.07											R	331,881
he Harold Hyam Wingate Foundation	R -						1				i				R	164,700
he Paul G. Allen Family Foundation (Endowed Scholarship) he Victor Rothschild Memorial Fund	R 110,000.00 R 332,472.10			000,00 472,10			l					1			1	
odacom	R 360,000.00			000.00		R 120,000.00	1		R	120,000.00					1	
Westergren	R -		,												R	1,511,115
/orkshops		R 139,839.80					1								R	218,421
hther Income: Contribution by Projects (Accom.& Admin Fees)		R 2,129,252.00 R 32,000.00		- 1											1	
Other income: Contribution by Cost Centre: AIMSSEC	R 300,900.00			1							R	180,900.00			1	
Other Income: Interest Received		R 643,874.47									R	37,239.76		21	R	939,822
OTAL EXPENSES	R 18,944,875.31	R 5,795,336.35	R 4.494.	352.82	R 3.500.036.08	R 1,641,500.00	R	359,601.81	R 1	.083.655.15	R	205,361.96	R	1,865,031.15	R	14,754,258
ccommodation (General Overhead Levy)	R 1,379,252.00		R 1,041,				R	58,500.00		108,000.00			R	10,000.00		0.000 0.000000
dministration Fees (University of Stellenbosch)		R 38,150.00					1232	1000000		100 000 000		1			R	36,360
dministration Fees (General Overhead Levy)	R 750,000.00 R 145,024.69	R 95,897.09	R 480,		R 250,000.00		R	10,000.00	R	10,000.00					R	30,248
dvertising udio Visual Equipment	R 145,024.69	K 95,897.09			R 49,127.60										R	36,702
udit Fee	R 37,682.28		R 18,	841.14	R 18,841.14										R	2011.00
ffiliation Fees	R 20,127.19	R -4,652.81		780.00											R	84,228
ook and periodicals	R 320.00		R	320.00											R	672
uilding, Building Refurnish Costs, Equipment & Furniture sursaries	R - 1,791,500.00					R 1,641,500.00					R	150,000.00			R	3,581,286 1,422,485
atering		R 266,565.68	R 988.	548.00	R 145,557.00	1,041,500.00	R	55,500.00	R	222,000.00	"	150,000.00	R	8,470.75		1,848,868
leaning and Sanitation		R 17,401.63						86						13.53	R	37,476
computer Materials		R 124,607.67			27 1/21/202 121		_		R	18,840.21					R	161,071
onsultation Fees and Services		R 5,895.31			R 154,013.69		R	20,000.00 112,583.71	R	135,100.45			R	614,981.03	R	314,970 164,307
apital Expenses : Computer Equipment consumable Materials		R 371,526.26 R 181,205.59			R 810,602.72	R -	K	112,000.11	R	611.07					R	104,307
copying and Printing		R 5,244.92	1			T. T.				-11.07			8		R	44,447
ourses	R 12,272.00	R 950.00	R 3,	402.00	R 7,920.00										R	31,880
lowers and Gifts		R 1,322.29													R	2.07
oreign Exchange Loss		R 3,866.19 R -133,594.23											R	2,405.44	R	2,874 29,653
eneral Office Expenses surance		R 42,932.83			R 21,960.00								"	2,400.44	R	57,063
nternal Transfer of Funds	R 664,944.20							Sangagagagaga anasasa an a					R	664,944.20	R	
ternet Expenses		R 34,043.00	R 85,	107.50	R 119,150.49		R	17,021.50	R	85,107.50					R	200,835
laintenance of Equipment		R 11,929.68	B 401	260 40	P 2/ 729.00				, p	18,205.00					R	27,035
ledical Expenses Iuncipal Expenses: Electricity,Rates, Refuse, Water	R 344,301.10 R 592,547.22	R 549,508.85	K 301,	368.10	R 24,728.00				\ \	10,200.00	R	43,038.37			R	138,540 313,618
hotographic Materials		R 3,064.56									l '	,,			R	3,586
ostage		R 5,313.61	1												R	2,042
emuneration		R 2,634,614.49			R 1,033,315.18										R	2,667,832
ent of Equipment epairs & Maintenance		R 323.01 R 789,756.17	1						R	78,492.44	R	12,323.59			R	25,252
epairs & maintenance epatriation costs (students)	R 605,500.00	, , , , , , , , , , , , , , , , , ,	R 595,	500.00	R 10,000.00					70, 102.74	l.,	. 2,020.00			R	353,800
ecurity Services	R 11,827.25	R 11,827.25													R	9,413
maller Furniture & Equipment		R 6,827.61	1						1		1				R	AA ===
tationery	R 38,028.62 R 510.262.50	R 38,028.62	D 400	400.00			P	20,772.50	R	3,000.00					R	62,550 480,571
		R 65,771.64	R 486,	490.00			R	20,772.50	"	3,000.00			R	1,736.47		60,986
			R 468,	013.08	R 341,855.73		R	65,224.10	R	104,168.86			R	562,493.26		2,523,598
tudent Stipends elephone and Cell Phone Costs ravel Expenses	R 1,918,764.47		100		R 52,195.53	1	1	0.0000000000000000000000000000000000000		300,129.62	1					CONTRACTOR OF THE SECOND
elephone and Cell Phone Costs ravel Expenses apital Expenses : Furniture	R 352,325.15		1			l	1		100	,	ı					
elephone and Cell Phone Costs ravel Expenses apital Expenses : Furniture uilding Maintenance Reserve Fund	R 352,325.15 R 250,000.00				R 150,000.00											
elephone and Cell Phone Costs ravel Expenses apital Expenses : Furniture uilding Maintenance Reserve Fund omputer / Equipment Replacement Reserve Fund	R 352,325.15 R 250,000.00 R 300,000.00	R 150,000.00			R 150,000.00 R 150,000.00	D 472 902 00	P	-284 604 84			P	12 777 90	P	-1 865 n24 4E	P	A 383 350
elephone and Cell Phone Costs avel Expenses apital Expenses : Furniture uitding Maintenance Reserve Fund	R 352,325.15 R 250,000.00 R 300,000.00 R 76,965.21		R 711,	446.59	R 150,000.00 R 150,000.00 R 3,094,963.92	R 473,803.00 R 414 468 75	R	-284,601.81 120,000 00	R	-963,655.15	R			-1,865,031.15 3,354,411.92		

SIGNED...

Ms F Majiet Deputy Director: Financial Services



Notes to the financial statement for AIMS (Cost centre R028) for the year ended 31 December 2009

These financial statements are official documents of Stellenbosch University who provide financial administration services to AIMS.

Income

- 1. The donation received from Arcadia Trust is for 15 diploma student bursaries and 10 half-bursaries for Post AIMS studies.
- 2. Funding received from Barclays PLC is for 20 diploma student bursaries.
- 3. The donation from Cambridge University Press is for 6 diploma student bursaries.
- 4. Funding received from the Cynthia & George Mitchell Foundation is for 2 student bursaries.
- 5. The funds received from the Department of Science and Technology cover:
- 5.1. A grant for African tutors and researchers
- 5.2. A contribution to core funding.
- 6. The donations received from Avery Tsui Foundation, Peter Kellner and Neil Turok, which have been endowed and called the Stephen Hawking and Martin Rees Endowed Scholarships respectively, provides AIMS with 2 diploma student bursaries per annum.
- 7. An endowed scholarship received from The Paul G Allen Foundation provide AIMS with 1 diploma student bursary per annum.
- 8. The donation received from the Victor Rothschild Foundation is for 4 diploma student bursaries.
- 9. Funding received from Vodacom is for 2 diploma student bursaries, 2 half-bursaries for post-AIMS studies and 1 postdoctoral fellowship.
- 10. Funding received from Neil Turok and Hand Drum Rhythms contributes towards diploma student bursaries.

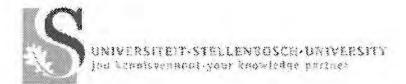
Expenses

- 1. All expenses shown for 2009 refer to actual costs directly attributable to the relevant AIMS Projects, as detailed on the financial statement.
- 2. Accommodation costs refer to costs for students, lecturers, tutors residing at 6 Melrose Road and 16 Watson Street for the duration of the academic year and for visiting researchers residing at 14 Watson Street during the year under review. These costs include municipal services, repairs and maintenance to buildings and insurance which were previously shown as separate expenditure items under each project.
- 3. Administration Fees refer to costs for delivering administrative support to AIMS by Stellenbosch University.
- 4. Administration Costs include general administration and other general expenses of the institution, departmental administration, sponsored projects administration, student administration and services which includes affiliation costs, computer materials costs, consumables, general office costs, staff costs, telephone costs etc. previously shown as separate expenditure items.
- 5. Bursaries and stipendia, staff remuneration, meals for students, conferences and visitors, and travel costs (students and lecturers) comprise the largest portion of the expenses.
- 6. During the 2009 financial year, AIMS upgraded their computer system which included purchasing of new computers, network servers, wireless routers, UPS and switches.
- 7. During the year under review, two reserve funds were created, namely, Computer/Equipment Replacement Reserve Fund and Building Maintenance Reserve Fund. These reserves are based on budgetary projections on expenditures for the replacement of computers and equipment and the maintenance and replacement of property components over a 3 to 5 year period.

Balance

As per the Financial Statement for the year ended 31 December 2009, accumulated funds include earmarked funds as listed. Any project shortfalls are taken from existing funds available.

Financial Report AIMS Research Centre



STELLENBOSCH UNIVERSITY AIMS RESEARCH CENTRE (27798)

Financial Statement for the year ended	31/12/2009	31/12/2008
	R	R
INCOME	3,927,412.87	3,600,000.00
National Research Council (NRF)	3,600,000.00	3,600,000.00
Foreign Exchange Profit	9.83	-
Interest	327,403.04	
EXPENDITURE	1,697,150.42	
Accommodation and Catering	252,032.51	-
Audio Visual Expenses	50,357.80	2
Bursaries	363,988.53	
Consultation Fees and Services	102,501.99	9
Consumables	15,376.88	
Furniture and Equipment	350,453,42	
General Office Expenses	684.00	1.4
Medical Expenses	22,400.00	-
Printing and Stationery	40,315.08	
Remuncration	193,153.81	
Student Stipends	19,600.00	-
Travel Expenses	286,286,40	
NET INCOME OVER EXPENDITURE	2,230,262.45	3,600,000.00
ACCUMULATED FUNDS AT 1 JANUARY 2009	3,600,000.00	FREE ASSECTATION AND
FUNDS AVAILABLE AT 31 DECEMBER 2009	5,830,262.45	3,600,000.00

SIGNED ...

Ms F Majlet

Head: Financial Services



Notes to the financial statement for the AIMS RESEARCH CENTRE (Cost centre 27798) year ended 31 December 2010.

- 1. Accommodation and catering costs refer to costs for visiting researchers, postdoctoral fellows and Master's students residing at 14 Watson Street, Muizenberg during the period under review.
- 2. Bursary costs include bursaries paid to postdoctoral fellows and student fees for 3 Master's students.
- 3. Furniture and equipment includes the acquisition of desks, chairs, bookshelves, computers, printers, projectors, cubicles and a photocopier in order for the Research Centre to function optimally.
- 4. Medical expenses refer to medical costs for postdoctoral fellows, Master's students and visiting researchers for the duration of their stay at AIMS.
- 5. Salary costs and consultation fees include salaries for resident and senior researchers, part costs for Project Co-ordinator and honorarium stipends to visiting researchers not covered by grants received from the Ford Foundation or Vodacom.
- 6. Student stipends refer to stipends paid to Master's students.



Financial Report AIMSSEC



STELLENBOSCH UNIVERSITY AIMSSEC - R268

Financial Statement for the year ended	31/12/2009	31/12/2008
	R	R
INCOME	1,001,716.74	431,647.41
Donations		
British and Foreign Schools Society	- 1	64,124.93
Education without Borders	40,000.00	,
Dr David Race	- 1	1,538,85
Sproptimist Club of West Lothian	- 1	14,659.20
St John's College, Cambridge	14,490.60	15,165.00
Victor Rothschild Memorial Fund	332,472.10	
Weoley Hill United Reform Church	- 1	10,019.70
Other income: Sundry and Surcharge	63,741.68	59,662.01
Department of Education: Kwazulu Natal	307,027.00	100,800.C0
Department of Education: Western Cape	32,400.00	145,600.C0
IMSTUS	191,607.44	1
Foreign Exchange Profit	1,282.46	780.83
Interest Received	18,695.46	19,296.89
EXPENDITURE	1,057,557.95	590,864.96
Advertising	4,275.00	21,117.98
Accommodation and Catering	244,853.81	136,387.80
Affilliation and Registration Fees	400.00	
Books		2,426.01
Consultation Fees and Services	13,000.00	5,000.00
Foreign Exchange Loss	494.99	76.20
General Office Expenses	16,948.11	12,898.70
Postage	1,197.65	995.16
Remuneration	348.236.49	-
Services	1,998.00	8,705.00
Stationery and Printing	17,018,44	23,133.09
Telephone and SMS	1,197.00	200
Travel Expenses	407,938,46	380,125.02
NET INCOME OVER EXPENDITURE	-55,841.21	-159,217.55
ACCUMULATED FUNDS AT 1 JANUARY 2009	223,531.14	382,748.69
FUNDS AVAILABLE AT 31 DECEMBER 2009	167,689.93	223,531.14

Ms F Majiet Head: Financial Services

Supporters

AIMS acknowledges with gratitude the generous support of the following donors:

Current donors (more than R30 000) The Department of Education, South Africa

Department of Science and Technology, South Africa

Government of Canada/IDRC

Google Inc. Charitable Giving Fund of Tides Foundation

Arcadia **Barclays**

Paul G Allen Family Foundation

The Avery-Tsui Foundation

National Research Foundation

Fondation Philanthropia

Cambridge University Press

Vodacom Foundation, South Africa

Canon Collins Educational Trust for Southern Africa

The Victor Rothschild Memorial Fund

Peter Kellner

Cynthia and George Mitchell Foundation

The London Mathematical Society

DAAD

Scribblers' Club — Borderless Media Strategies

The Muizenberg Millenium Education Trust

Stellenbosch University

Neil Turok

Previous donors (more than R30 000)

Anglo American Chairman's Funds

Africa Science Program, Institut des Hautes Etudes Scientifiques, France

Andrew W. Mellon Foundation

Byers Family

British Airways, South Africa Office

Cheryl Grunbock and Martin King

Chicago State University

Daniel lagolnitzer Foundation (Fondation De France)

David and Elaine Potter Charitable Foundation

European Mathematical Society Committee for Developing Countries

Ellison Medical Foundation

Fred Turok

Ford Foundation

Gatsby Charitable Foundation, UK

Go Open Source Campaign

Hand Drum Rhythms, Victoria BC

Harold Hyam Wingate Foundation

Hyper-Interactive Teaching Technology

ICIAM

Institute of Physics

International Union of Theoretical and Applied Mechanics (IUTAM)

International Council of Scientific Unions (ICSU), with UNESCO and the US State Department

Isle of Man Government Overseas Aid Committee

Jonathan Leake, Sunday Times

Jussi Westergren

Nokia

New Star Asset Management

PetroSA, South Africa

Seardel Investment Corporation Ltd

Sheridan Lorenz

Stella Innes, for the donation of the remarkable mathematical research library of her late husband, Evan Innes

SUN Microsystems

Trinity College, Cambridge

Vodafone Group Foundation, UK

AIMSSEC Sponsors (more than R30 000)

Datatec Educational and Technology Trust

Department of Education: Eastern Cape Department of Education: Kwazulu-Natal

Department of Education: Western Cape

Education Without Borders

Sankhyaa Learning Private Limited (HeyMath!)

May & Stanley Smith Charitable Trust

Victor Rothschild Memorial Fund Zenex Foundation







Future Plans

Reflecting on the achievements of the past seven years, the opportunities for greater cooperation and involvement in South Africa and the exciting and ambitious AIMS-NEI plan, we are aware that AIMS has now reached a watershed.

It is well positioned to play a more prominent role as a national institute for the mathematical sciences in South Africa, involved in education, training and research and as strong partner in the development of similar centres in other African countries. We look forward to this challenge and are grateful for the broad support we are receiving, while working to achieve these goals.



